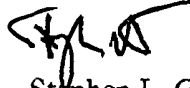


REMARKS

- 1) The specification has been amended to correct a number of minor typographical, syntactical, and grammatical features. These amendments do not add new matter.
- 2) Claims 9 – 12 have been cancelled without prejudice to further prosecution thereof by way of continuation, or division. as may be appropriate.
- 3) The applicant submits that the claims currently pending in the case are in a condition for allowance.
- 4) The applicant is also presenting documents to add Mohamed A. Khattab as an inventor in the case.

Respectfully submitted,



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VERSION WITH MARKINGS TO SHOW CHANGES MADE

In the Abstract

The Abstract is amended as follows:

A center beam car has a main deck structure extending laterally from a main center sill, a laterally extending top truss structure, and a central vertically oriented central beam structure. The center beam so formed defines bunks upon [in] which to carry cargo. The upper region of the web-work structure includes a top chord mounted to run between two end bulkheads. The deck has a central portion and end portions. The end portions of the deck are carried at a greater height than the center portion, the difference in height corresponding to the height of a bundle of lumber. The car has a center sill having a depth corresponding to the depth of the step in the deck. The end portion of the center sill has an internal plate defining a draft gear pocket upper wall. The medial portion of the center sill is narrower than the end portion, and of deep section, such that it has a high aspect ratio. Web separators are mounted in the medial portion of the center sill by a method that includes making part of the weld from outside the center sill through welding apertures. As the end deck is carried at a high level, the bolster is abnormally deep.

In the specification

The numbered paragraphs are amended as follows:

[0023] In still another feature of that aspect of the invention, the center beam rail road car further includes a center sill running along the deck structure. The first end portion of the deck structure [having] has a first end deck sheet. The center sill has a first center sill end portion. The center sill end portion has an upper flange and a pair of spaced apart webs extending downwardly from the upper flange. A draft pocket cap plate is mounted within the first center sill end portion between the pair of spaced apart webs. The draft pocket cap plate lies at a lower level than the deck sheet, and a draft pocket is defined between the pair of webs and below the draft pocket cap plate. In another feature of that additional feature, a first bolster extends laterally from the main sill to support the first end portion of the deck structure[~~, the~~]. The bolster [~~having a~~] has an upper flange extending in a plane lying at a greater height from top of rail than

the draft pocket cap plate. In still another additional feature, the center sill has a central portion adjacent to the medial portion of the decking structure and first and second end portions adjacent to the first and second end portions of the decking structure. The central portion of the center sill has an upper flange, a pair of spaced apart webs extending downwardly from the upper flange and a lower flange mounted to the webs. The upper flange, the lower flange and the webs of the center sill define a hollow box beam. The medial portion of the deck structure has a deck sheet; and the lower flange of the central portion of the center sill is mounted at a level corresponding to the deck sheet of the medial portion of the decking structure. In an additional feature, the center sill has a depth of section between the upper flange and the bottom flange of at least 30 inches.

[0024] In another aspect of the invention, there is a center beam rail road car having a deck structure carried on railcar trucks for rolling motion in a longitudinal direction. A pair of first and second bulkheads extend upwardly of the deck structure at either end thereof. A central beam assembly stands upwardly of the deck structure and runs lengthwise along the deck structure between the bulkheads. The central beam assembly has a top chord spaced upwardly from the deck structure. The top chord is rigidly connected to the bulkheads. The first bulkhead has a bulkhead sheet having a first face oriented longitudinally inboard, and a central vertical post mounted longitudinally outboard of the bulkhead sheet. The central vertical post includes a pair of first and second spaced apart webs extending longitudinally outboard of the sheet. The central beam assembly [~~including~~] includes a shear panel extending longitudinally inboard of the bulkhead sheet[~~, the~~]. The shear panel [~~lying~~] lies in a plane offset from the webs. The bulkhead has transverse beams mounted between the webs of the central vertical post. The bulkhead has at least one shear panel extension member mounted to the bulkhead sheet and extending longitudinally outboard therefrom. The shear panel extension is connected to at least one of the transverse beams.--

[0025] In still another feature, at least one of the transverse beams includes arms extending transversely outboard of the webs of the vertical post along the bulkhead sheet. In yet another feature, the central beam assembly includes a top chord mated with the bulkhead in line

with the central vertical post, and the bulkhead includes a cross beam mated to the central vertical post at a level corresponding to the top chord. In another feature, the cross beam lies longitudinally outboard of the bulkhead sheet and includes an arm having a proximal portion mounted to the vertical post, and a distal portion lying transversely outboard thereof~~[, the]~~. The arm ~~[being]~~ is tapered to a smaller section at the distal portion than at the proximal portion.

[0026] In a further aspect of the invention, there is a center beam rail road car having a deck structure carried on railcar trucks for rolling motion in a longitudinal direction~~[, a]~~. A pair of first and second bulkheads ~~[extending]~~ extends upwardly of the deck structure at either end thereof~~[, and a]~~. A central beam assembly ~~[standing]~~ stands upwardly of the deck structure and running lengthwise along the deck structure between the bulkheads. The central beam assembly has a top chord spaced upwardly from the deck structure at a first height relative to top of rail~~[, the]~~. The top chord ~~[being]~~ is rigidly connected to the bulkheads. The first bulkhead has a bulkhead sheet having a first face oriented longitudinally inboard, and a central vertical post mounted longitudinally outboard of the bulkhead sheet. The central beam assembly includes a top chord mated with the bulkhead in line with the central vertical post. The first bulkhead has a cross beam mated to the central vertical post at a height corresponding to the first height of the top chord. The cross beam lies longitudinally outboard of the first bulkhead sheet and includes a pair of first and second arms extending to either side of the central vertical post. Each of the arms has a proximal portion mounted to the vertical post, and a distal portion lying transversely outboard thereof. Each arm is tapered to a smaller section at the distal portion than at the proximal portion, whereby the connection of the top chord to the first bulkheads is reinforced both vertically and transversely. In an additional feature of that ~~[asapeet]~~ aspect of the invention, the first bulkhead extends to a second height relative to top of rail~~[, the]~~. The second height ~~[being]~~ is greater than the first height.

[0027] In still another aspect of the invention, there is a center beam rail road car having a deck structure carried by rail car trucks~~[, each]~~. Each of the cars ~~[having]~~ has a truck center. A central beam assembly runs lengthwise along the rail road car~~[, the]~~. The central beam assembly ~~[standing]~~ stands upwardly of the deck structure. A center sill supports at least a portion of the

deck structure~~[, the]~~. The center sill ~~[extending]~~ extends longitudinally above at least one of the trucks. The center sill has a top flange and a pair of spaced apart webs extending downwardly from the top flange. A bolster supports at least a portion of the deck structure. The bolster extends laterally from the center sill abreast of the truck center. The central beam assembly ~~[having]~~ has a post extending vertically upward above at least one of the truck centers~~[, the]~~. The post ~~[having]~~ has a first pair of flanges each lying in a longitudinal vertical plane, and a second pair of flanges each lying in a cross-wise vertical plane. The post is mounted to the center sill in a mounting arrangement having flange continuity above and below the level of the top flange of the center sill.

[0028] In an aspect of the invention, there is a center beam rail road car having a deck structure supported on rail car trucks~~[, the]~~. The deck structure ~~[having]~~ has first and second end portions and a medial portion lying between the first and second end portions~~[, the]~~. The medial portion ~~[being]~~ is stepped downward relative to the end portions. A central beam assembly ~~[running]~~ runs lengthwise along the rail road car between the bulkheads~~[, the]~~. The beam assembly ~~[standing]~~ stands upwardly of the deck structure. The medial portion ~~[being]~~ is stepped downward relative to the end portions by a distance of at least 30 inches.

[0029] In an additional feature of that aspect of the invention, a center sill extends along the rail road car~~[, the]~~. The center sill ~~[having]~~ has an upper flange, a lower flange, and at least one upright web connecting the upper and lower flanges. At least a portion of the upper flange ~~[lying]~~ lies at a first height corresponding to the first end portion of the deck structure. At least a portion of the lower flange ~~[lying]~~ lies at a second height corresponding to the medial portion of the deck structure. In another feature, the center sill has two, spaced apart upright webs. The center sill has a height measured across the upper and lower flanges, and a width measured across the webs~~[, and along]~~. Along at least part of the center sill between the trucks, the center sill has an aspect ratio of the height to the width of at least 2.4 : 1.0.

[0030] In a further feature, the central beam assembly includes an array of posts extending upwardly from the center sill~~[, at]~~. At least one of the posts ~~[having]~~ has a roll-formed section, and at least part of the roll formed section ~~[being]~~ is oriented to present a smooth, roll

formed surface to lading placed outboard thereof. In a further additional feature, at least the one post is a hollow four sided tube. In a still further feature, along the medial portion of the deck structure, the center sill has at least one web separator plate mounted between the webs of the center sill. In another feature, a transversely oriented step bulkhead extends upwardly between the medial portion of the deck structure and the first end portion of the deck structure, and a foothold is mounted to the step bulkhead to facilitate ascent from the medial portion of the deck structure to the end portion of the deck structure.

[0031] In another aspect of the invention, there is a center beam rail road car, having a deck structure mounted on a pair of first and second spaced apart rail car trucks. A central vertical web assembly runs along the car, the vertical web assembly extending upwardly of the deck structure, and a top chord surmounting the vertical web assembly. The deck structure includes first and second end decking portions mounted over the respective first and second trucks. The first and second end decking portions have structural members presenting respective first and second end portion load bearing interfaces, and a medial decking portion lying between the trucks. The medial decking portion has at least one member presenting a medial load bearing interface. The medial load bearing interface is stepped downward relative to the first portion load bearing interface through a step distance [~~-, and~~]. The step distance [being] is greater than 30 inches.

[0034] In another aspect of the invention, there is a center beam rail road car having a deck structure mounted on a pair of first and second spaced apart rail car trucks for rolling motion in a longitudinal direction. A central beam assembly runs along the car, the central beam assembly extending upwardly of the deck structure. The deck structure includes first and second end decking portions mounted over the respective first and second trucks, and a medial decking portion lying between the trucks. The medial decking portion is stepped downward relative to the first and second end decking portions. The medial decking portion has a pair of medial decking side sills mounted therealong. At least one of the end decking portions has a pair of end decking side sills mounted therealong[~~;~~]. The end decking side sills [having] have a greater depth of section than the medial decking side sills.

[0036] In still another ~~[aspect]~~ aspect of the invention, there is a center beam rail road car having a deck structure ~~[having]~~ The deck structure has first and second end portions and a medial portion lying between the first and second end portions~~[-the]~~ The medial portion ~~[being]~~ is stepped downward relative to the end portions. First and second end bulkheads ~~[extending]~~ extend upwardly from opposite ends of the deck structure. A central vertical beam assembly ~~[running]~~ runs lengthwise along the rail road car between the bulkheads~~[-]~~ ~~[‡]~~ The beam assembly ~~[including]~~ includes a center sill, a top chord spaced upwardly from the center sill, and structural members extending upwardly of the deck structure, the structural members connecting the center sill and the top chord. The first end portion of the deck structure ~~[having]~~ has a first end deck sheet. The center sill has a first center sill end portion ~~[-the]~~ The center sill end portion ~~[having]~~ has an upper flange and a pair of spaced apart webs extending downwardly from the upper flange. A draft pocket cap plate is mounted within the first center sill end portion between the pair of spaced apart webs~~[-the]~~ The draft pocket cap plate ~~[lying]~~ lies at a lower level than the deck sheet. A draft pocket is defined between the pair of webs and below the draft pocket cap plate.

[0041] In an additional feature of that aspect of the invention, a first bolster extends laterally from the ~~[main]~~ center sill to support the first end portion of the deck structure~~[-the]~~ The bolster ~~[having-a]~~ has an upper flange extending in a plane lying at a greater height from top of rail than the draft pocket cap plate. In another feature of that aspect of the invention, side sills extend along either side of the deck structure. The side sills each have a medial portion running along the medial portion of the deck structure, and first and second end portions running along the first and second end portions of the deck structure. The end portions of the side sills have a greater depth of section than the medial portions of the side sills.

[0043] In an additional feature of that further aspect of the invention, the first portion of the center sill includes a first pair of spaced apart webs. The second portion includes a second pair of spaced apart webs. The first portion has a first width measured across the first pair of webs. The second portion has a second width measured across the second pair of webs, and the second width is less than the first width. In another additional feature, the center sill includes a third portion between the first and second portions, and the third portion tapers from the first

portion to the second portion. In another feature, the second portion of the center sill has a greater depth than the first portion of the center sill. In still another feature, the first portion of the center sill includes members defining a draft pocket therein, and the first portion of the center sill has an overall height greater than the draft pocket. In a further feature, the second portion has a height and a width, and the ratio of the height to the width [~~is greater than~~] is greater than 2 : 1. In a still further feature, the ratio lies in the range of 3.0 : 1 to 5.0 : 1. In a preferred feature, the ratio is about 3.4 : 1.

[0044] In another feature of that aspect of the invention, the first portion has a height and a width, and the ratio of the height to the width is greater than 1 : 1. In still another feature the ratio is in the range of 1.5 : 1 to 3.0 : 1. In yet another, preferred feature, the aspect ratio is about 2.0 : 1.

[0046] In an additional feature of that aspect of the invention, the web member has a flange mounted along an edge thereof, the apertures each have a periphery, the flange is mounted next to the welding apertures, and the flange is welded to the center sill at a weld formed along at least a portion of the periphery of at least one of the apertures. In another feature, the web is a first web, the central beam assembly includes at least one post standing upwardly of the center sill. The post has a second web standing in a vertical plane perpendicular to the rolling direction of the rail road car, and the first web is positioned to provide web continuity with the second web. In another feature, [~~the web is a first web,~~] the central beam assembly includes at least one post standing upwardly of the center sill, the post having a [~~second~~] third web standing in a vertical plane perpendicular to the rolling direction of the rail road car, and the first and [~~second~~] third webs are co-planar. In another feature, the ratio of the height to the width is greater than 2.0 : 1. In a preferred feature, the ratio of the height to the width is greater than 3.0 : 1.

[0048] In yet another further aspect of the invention, there is a center beam rail road car having a deck structure carried on railcar trucks for rolling motion in a longitudinal direction, and a central beam assembly standing upwardly of the deck structure and running lengthwise

along the deck. The deck structure ~~[being]~~ is supported by a center sill. The deck structure includes a first portion mounted above one of the trucks, and a second portion mounted between the trucks~~[, the]~~. The second portion of the deck structure ~~[being]~~ is stepped downwardly relative to the first portion of the deck structure. The center sill has a first portion mounted between the trucks~~[, the]~~. The first portion ~~[having]~~ has a height and a width~~[, the]~~. The height ~~[being]~~ is greater than the width in a ratio of at least 2:0 : 1.0. The center sill ~~[having]~~ has at least one internal web separator mounted therewithin.

[0050] In yet a further aspect of the invention, there is a center beam rail road car having a center sill supported by rail car trucks. A deck structure is mounted to the center sill and extends to either side thereof~~[, the]~~. The deck structure ~~[having]~~ has first and second end portions and a medial portion lying between the first and second end portions~~[, the]~~. The medial portion ~~[being]~~ is stepped downward relative to the end portions. A central beam assembly runs lengthwise along the rail road car~~[, the]~~. The central beam assembly ~~[standing]~~ stands upward of the deck structure. The first end portion of the deck structure ~~[having]~~ has a first end deck sheet. The center sill has a first center sill end portion. The center sill end portion has an upper flange and a pair of spaced apart webs extending downwardly from the upper flange. A draft pocket cap plate is mounted within the first center sill end portion between the pair of spaced apart webs, the draft pocket cap plate lying at a lower level than the deck sheet. A draft pocket ~~[being]~~ is defined between the pair of webs and below the draft pocket cap plate.

[0051] In another aspect of the invention, there is a center beam rail road car having a deck structure having first and second end portions and a medial portion lying between the first and second end portions~~[, the]~~. The medial portion ~~[being]~~ is stepped downward relative to the end portions. First and second end bulkheads extend upwardly from opposite ends of the deck structure. A central vertical beam assembly runs lengthwise along the rail road car between the bulkheads~~[, the]~~. The beam assembly ~~[including]~~ includes a center sill, a top chord spaced upwardly from the center sill, and posts extending upwardly of the deck structure~~[, the]~~. The posts ~~[connecting]~~ connect the center sill and the top chord. The first end portion of the deck

structure has a first end deck sheet. The center sill has a first center sill end portion~~[, the]~~. The center sill end portion ~~[having]~~ has an upper flange and a pair of spaced apart webs extending downwardly from the upper flange. A draft pocket cap plate is mounted within the first center sill end portion between the pair of spaced apart webs~~[,]~~. ~~[t]~~ The draft pocket cap plate ~~[lying]~~ lies at a lower level than the deck sheet, and a draft pocket is defined between the pair of webs and below the draft pocket cap plate.

[0054] Figure 1 shows an isometric, general arrangement view of a center beam rail road car having a depressed center deck;

Figure 2a shows a side view of a center beam rail road car similar to the center beam car of Figure 1;

Figure 2b shows a top view of the center beam rail road car of Figure 2a;

Figure 2c shows a side view of an alternate configuration of car to that shown in Figure 2a;

Figure 2d shows a top view of the center beam rail road car of Figure 2c;

Figure 3 shows a perspective view of a detail of a deck transition section of the center beam car of Figure 2a;

Figure 4a shows a cross-section of the car of Figure 2a taken on section '4a - 4a';

Figure 4b shows a cross-section of the car of Figure 2a taken on section '4b - 4b';

Figure 4c shows a cross-section of an end deck looking toward the main bolster of the car of Figure 2a taken on Section '4c - 4c';

Figure 4d shows a cross-section of an end deck looking toward a cross-tie of the car of Figure 2a taken on Section '4d - 4d';

Figure 4e is a cross-section of the center sill of the railcar of Figure 2a looking horizontally on a vertical plane, indicated as '4e - 4e' in Figure 2b;

Figure 4f is a partial top view of the center sill of Figure 4e, in a region inboard of the main bolster with top flange removed;

Figure 4g is a partial sectional view of a detail of the center sill of Figure 4f taken at the main bolster;

Figure 4h is a cross section of a portion of the center sill of Figure 4e as viewed from above, taken on a horizontal plane, indicated as '4h - 4h' in Figure 2a;

Figure 4i shows a cross section of a deck knee of the rail car of Figure 2b taken on '4i - 4i';

Figure 5a shows an isometric view of the end bulkhead of the center beam car of Figure 2a;

Figure 5b shows a half section of the bulkhead of Figure [2a] 5a looking vertically downward on section '5b - 5b' in Fig. 5c; and

Figure 5c shows a partial section of the bulkhead of Figure [2a] 5a looking horizontally inboard on section '5c - 5c'.

[0065] Figure 4a is a half sectional view of center beam railroad car 20 taken at mid-span of medial deck portion 29, looking toward the nearest adjacent cross-bearer 40. Figure 4b is a half sectional view of facing knee 47 (or 49). The outline of AAR Plate F is indicated generally as Plate 'F'. The main center sill is indicated, as above, as 36. It has an upper horizontal member in the nature of main sill upper flange 102, and a pair of spaced apart vertical shear carrying members in the nature of left and right hand main sill webs 103, 104, thus forming three sides of a box. The fourth side of the box is formed by a lower horizontal member, in the nature of a main sill lower flange 106. Lower flange 106 has an end portion, running along the outboard portion of main sill 36, in a manner similar to a stub sill, indicated in Figure 4e as 108 at a height for mounting upon truck 22 or 23 as the case may be. An internal web, or false flange, 226, noted below, is mounted between webs 103 and 104 at a height part way between the height of portion 108 and upper flange 102. Rectangular draft pocket 224 is defined between items 226, 103, and 104 and is of a size and shape to receive draft gear and the shank of a coupler, such as coupler 38.

[0069] As seen in Figures 4a and 4b, medial side sill portion 45 has a channel-like profile, having top or upper flange 130, noted above, a bottom or lower flange 132, and a back, or web, 134. However, while top flange 130 and bottom flange 132 lie in parallel horizontal planes, web 134 does not stand perpendicular to them, and does not stand vertically perpendicular. Rather, web 134 is canted upward and outward at an angle ϕ measured from the vertical, such that flange 130 is displaced, or skewed, or stepped, outward relative to flange 132. As seen in Figure 4a, the extent of this outward positioning is such that both upper and lower flanges fall within the envelope of Plate [C] F. A load securing device in the nature of a winch 138 is mounted to the outboard face of web 134 for tightening strapping 136 about the lading 137. The slanted incline of web 134 permits the center of rotation of winch 138 to be drawn inward toward the center line of rail car 20 (or 70), thus tending to permit the medial portion 29 of deck structure 26 to be carried at a lower height than might otherwise be the case.

[0071] The construction of end deck portion 28 (or 27), is shown in Figures 1, 2, and 3. Main bolster 200 (Figures 2b, 4c) extends laterally outward from the main sill 36 at the longitudinal station corresponding to the truck center, whether of truck 22 or 23, the car being symmetrical about its mid span transverse plane 31. The lower flange 208 of bolster 200 (Figure 4c) is formed to follow an upwardly and outwardly stepped profile to clear the wheels of truck 22 (or 23) through the turning envelope of the truck relative to the car body generally. End deck structure 140 (Figure 3) includes a cross tie 146 located roughly 8 ft longitudinally outboard of main bolster 200, (Figure 4c); cross tie 148 (Figure 2b) located roughly 4 ft. longitudinally outboard of main bolster [20e] 200; and cross tie 150 (Figure 2b) located roughly 4 foot longitudinally inboard of main bolster 200. A side sill end portion is indicated as 43 (Figure 3), and extends along the transversely outboard, or distal, ends of main bolster 200, and cross ties 146, 148 and 150 (Figure 2b).

[0072] Knee 47 (or 49 of opposite hand) is located at the transition, or step, between end portion 28 (or 27) and medial deck portion 29. Knee 47 is located at a mid-bay longitudinal station between the longitudinal stations of formed post 152 and post 154 (Figure 2a). As above,

the dropped deck portion of the deck (that is, medial deck portion 29) ends at left and right hand knees, indicated as 47, 49. Other than being of opposite hands, they are of identical construction. The medial portion of the side sills, 45, has been described above. The end portions 43 are formed from deep wide flange beams. As noted above, in the preferred embodiment, the depth of the beam is determined at the lower flange by the height required to give adequate clearance over the wheels when the car is fully loaded and cornering, and the upper height limit of the upper flange corresponds to the 33N" (+/- 1") height increment of the layers of bundles at the step in the deck at knees 47 and 49. End portions 43 terminate, at their inboard ends at knees 47 and 49, at a corner₇ 160, (Figure [49] 4i) that is enclosed with an angled end gusset 162 running on the diagonal between the upper and lower flanges of end portion 43.

[0082] Each of center beam cars 20 and 70 has an array of center beam web posts, indicated generally as 54 in the context of Figure 1. As shown in Figure 3, a horizontal cross-section of post 56 generally has a hollow rectangular shape and has smoothly radiused corners as received, typically from a rolling mill or other roll forming or pressing apparatus. Post 57, by contrast, has a horizontal cross-section of a C-shaped channel, with its web being the back of the C, and the flanges being a pair of legs extending away from the back. Post 57 is preferably a roll formed sheet, or pressing, having [~~smoothly~~] smoothly radiused corners. Posts 56, 57 (and 55) thus present smooth, planar surfaces to the lading with smoothly radiused corners. Each diagonal member, whether struts 63, 64 (Figure 2a) or braces 66, 67, 68 (or 74) has a first end rooted at a lower lug such as lower lug 230, welded at the juncture of one of posts 56 (or 55) with main center sill 36; and a second diagonal end rooted in an upper lug 232 (Figure 2a) at the juncture of another adjacent post 56 and top chord 32. Midway along its length, the diagonal member, whether struts 63, 64 or braces 67, 68, passes through the post 57 intermediate the pair of posts 56 (or 55 and 56) to which the diagonal member is mounted. It is intended that the respective sides of posts 55 and 56, and flanges of posts 57 lie in the same planes on either side of the central plane 24 of car 20 to present an aligned set of bearing surfaces against which lading can be placed. The side faces of posts 56 lie roughly at right angles to end deck portions 27, 28 and medial deck portion 29. This facilitates the placement of generally square cornered bundles in stacks in the bunks defined to either side of central web 30 (Figure 2a).

[0084] Figure 4h shows a horizontal cross-section of a portion of center sill 36 underneath a four sided hollow section post 56. Center sill 36 is reinforced along its length with vertically extending, transversely oriented webs separator plates, indicated as webs 290, 292 extending between vertical webs 103 and 104. Transverse webs 290, 292 are situated so as to provide web reinforcement to center sill 36 at the location of posts 56 and 57 respectively, tending to encourage the cross-section of main sill 36 to remain rectangular. Steel bars 294 are placed on the outboard side of vertical webs 103 and 104 to act as spacers between center sill 36 and the lading, bars 294 being thick enough to stand outwardly from web 103 or 104 a distance at least equal to the overhang of upper flange 102 beyond webs 103 and 104. The outboard corners of bars 294 are smoothly radiused to avoid presenting a sharp edge to the lading. Transverse webs 296 are shown in Figure 4e at the location of the webs of C-channel posts 57.--

[0086] As shown in Figure 4f plates 212 and 214 terminate longitudinally inboard of the truck center at a location indicated as 'X1'. Similarly, the inboard, mid-span portion of webs 103 and 104 of center sill 36 ends at a location indicated as 'X2'. In the transition region, or portion, between 'X1' and 'X2', main sill 36 narrows on a taper defined by converging side sill web portions 215, 217. When viewed in the side view of Figure 4e, it can be seen that portions 215 and 217 are trapezoidally shaped, and that while main sill 36 is narrowing in the lateral direction, it is also deepening in the vertical direction, as noted above. Internal gusset plates 219, 221 are mounted inside center sill 36 at locations 'X1' and 'X2' and tend to maintain the desired sectional profile at the transition junctions. By providing this transition section, center sill 36 has a first, relatively wide portion extending longitudinally outboard from location 'X1', and a second, relatively narrow middle, or waist, portion lying between 'X2' at either respective end of the car longitudinally inboard of the transition. In the preferred embodiment, the outboard portion is 12 - 7/8" inside to suit the draft gear and coupler, and 14" outside, measured across the webs; the inboard portion is 9" inside and 10" outside width, measured across the webs.

[0091] It may also be noted that center beam 36 has deep section as compared to center beam cars of which the inventor is aware. That is, the depth of the center beam, taken at mid-span between the trucks, corresponds to the depth of a loaded bundle of lumber, that depth being over 30 inches, namely $33 - 5/8$ inches (+/-) measured from lower flange 106 to upper flange 102, such that the deck sheets of medial portion 29 extends laterally outward from lower flange 106, and the deck sheets of end portion 27 and 28 extend laterally outboard away from upper flange 102. At mid-span center sill 36 has an aspect ratio of height (measured over upper and lower flanges, 102 and 106) to width (measured between the outside faces of webs 103 and 104) that is more than 2.4 : 1, lying in the range of 3.0 : 1 to 5.0 : 1. In the preferred embodiment, the aspect ratio is about 3.4 : 1. A high aspect ratio beam, as shown, tends to permit the deck sections to be mounted at heights corresponding to the center sill flanges, without tending to require relatively more complicated intermediate deck staging above the upper flange of the center sill, or other complications.--

[0099] The juncture of the web, namely panel 61 (or 62) is not aligned (i.e., is not coplanar with) with either leg 271 or leg 272 of box beam 252, but rather is welded amidst sheet 268 between them. This alone may not necessarily provide a fully satisfactory joint. Gusset plates 280, 281, 282 and 283 are welded in the same plane as panel 61 (or 62) to the back side, namely the longitudinally outboard face, of sheet 268 interstitially between the longitudinally inwardly extending horizontally planar legs of transverse beam members 261, 262 and 263, the end deck top flange 102, and the lower leg of C-channel stub portion 278. Gusset plates 28[0]1 to 283 act as web extensions such that the web formed by the combination of panel 61 (or 62). Conceptually, the central portions of transverse beams 261 to 265, welded with toes against sheet 268 form hollow section structural members of low aspect ratio (that is, their length between the legs of box beam 252 is short relative to their depth of section in the vertical direction). The vertical shear load imposed in gusset plates 28[0]1 to 283 (and in panel 60 or 61) is reacted at either end of the transversely extending hollow sections. Thus the shear transfer may tend to occur over a distance corresponding to the overlap, and the tendency to out-of-plane deflection may tend to be reduced since the junction of panel 60 (or 61) and sheet 268 is reinforced vertically, longitudinally, and in the transverse horizontal direction.